

PREVALENCE OF GLAUCOMATOUS RISK FACTORS IN PATIENTS FROM A MANAGED-CARE SETTING: A PILOT EVALUATION

Fang EN¹, Law SK², Walt JG³, Chiang TH³

¹Southern California Permanente Medical Group, Los Angeles, CA, USA, ²Jules Stein Eye Institute UCLA, Los Angeles, CA, USA, ³Allergan Inc, Irvine, CA, USA

OBJECTIVES: To determine the prevalence of glaucomatous risk factors (RFs) in glaucoma patients in a managed-care practice. **METHODS:** Retrospective review of medical records of 1189 glaucoma patients. Diagnosis and documentation information of 15 RFs reported to be associated with glaucoma progression were collected. The 15 RFs included age >70, family history, African American origin, high intraocular pressure (IOP), increase cup/disc (C/D) ratio, poor visual field score, disc hemorrhage, pseudoexfoliation sign, low central corneal thickness (CCT), high myopia, cardiovascular disease, systemic hypertension, diabetes mellitus (DM), migraine headache, and vasospasm. The average risk score for the population was calculated using the predictive model based on 5 risk factors (age, IOP, CCT, C/D ratio, VF score, and DM) derived from Medeiros et al. (2005), where a higher score indicates greater risk. **RESULTS:** A total of 1182 of 1189 patients for which medical records were available had a clear diagnosis in the charts. Mean age (63.0 ± 11.9 years) and the average IOP (18.3 ± 4.7 mm Hg) was calculated. Average value of C/D ratio was 0.52 ± 0.18 , pattern standard deviation was 2.59 ± 1.99 dB, and CCT was 552 ± 34 microns. The glaucomatous RF with the highest incidence was systemic hypertension (39.0%), followed by age >70 (27.2%), DM (23.6%), African American origin (23.0%), and a family history of glaucoma (18.2%). An average risk score was 42 for this population. **CONCLUSION:** Three of the five most prevalent glaucomatous RFs from this population were not included in the predictive model. The prevalence of RFs and risk scores may be compared with a non-glaucoma patient population or a population of glaucoma patients without glaucomatous RFs to determine the relative risk difference. Existing models for calculating glaucoma risk scores do not consider several important risk factors, and these variables should be considered in future calculation models.

EAR/EYE—Cost Studies

THE ECONOMIC BURDEN OF GLAUCOMA-RELATED VISUAL IMPAIRMENT

Kymes SM¹, Zhou Z², Plotzke M¹, Fain J³

¹Washington University, Saint Louis, MO, USA, ²Pfizer Inc, Bridgewater, NJ, USA, ³Pfizer Inc, New York, NY, USA

OBJECTIVES: We measured increased non-vision cost for progression to visual loss due to glaucoma. **METHODS:** We analyzed a random 5% sample of Medicare beneficiaries (1999–2003). Presence the ICD-9 code, 365.xx, in a 1999 claim was considered evidence of glaucoma. Inclusion required survival from 1999–2003. Moderate visual loss was defined as severe impairment in the worst seeing-eye (ICD-9 > 369.60). Severe visual loss was defined as severe impairment in best seeing-eye (ICD-9 369.10 to 369.41). Blindness was defined as near total to profound impairment in both eyes (ICD-9 369.0 to 369.09). We identified those who reported depression, injury and living in long-term care settings. We report the mean total medical costs for each group and the increased risk of depression or injury, and living in an institutional setting associated with progression. **RESULTS:** In total, 57,664 beneficiaries were

PEY2

reported as having glaucoma. 54,596 did not experience severe impairment in either eye, while 3068 beneficiaries (5.3%) reported severe impairment in at least one eye during the five year period. Increased visual impairment was associated with higher overall medical costs in 2003. Those who were blind had the highest cost of those who did not progress (\$11,568). Those who progressed from glaucoma to blindness had the highest overall cost (\$16,109). Among those who progressed to vision loss, progression to blindness had the highest incremental cost (\$5510). Those who progressed to any vision loss were more likely to be diagnosed with depression or injury, or to be in long-term care or skilled nursing facility than those who did not, including those who had visual impairment at the beginning of the period. **CONCLUSION:** Among people with glaucoma, progression to loss of visual function in even a single eye leads to higher medical costs during progression. A substantial portion of this cost is associated with avoidable conditions and institutionalization.

PEY4

INCREMENTAL COSTS ASSOCIATED WITH ANTIBIOTICS PRESCRIBED FOR ACUTE OTITIS MEDIA

Seal B¹, Mucha L², Lenhart G³, Asche C⁴

¹Sanofi-Aventis, Bridgewater, NJ, USA, ²Thomson Health Care: Medstat, Cambridge, MA, USA, ³Thomson Medstat, Cambridge, MA, USA, ⁴University of Utah, Salt Lake City, UT, USA

OBJECTIVES: The purpose of this study was to estimate the total and incremental costs associated with antibiotic treatments for acute otitis media (AOM). **METHODS:** Persons over age 18 were identified in the MarketScan databases July–December 2004. We identified AOM episodes for patients with claims for ICD9 codes 381.0X, 381.4X, 382.0X and 382.9X. We then identified the most frequently antibiotics prescribed as initial treatment for an AOM episode. Logistic regression estimated a propensity score for each patient; which was the predicted probability of using telithromycin. Patients were then matched according to this probability. Exponential conditional means models (ECM) were specified, controlling significant variables after the propensity score matching (demographics and comorbidities). These models allowed the incremental costs to be estimated for treatment of a reference drug, telithromycin, relative to other antibiotics. **RESULTS:** The most common initial antibiotic treatments compared to telithromycin for AOM (n = 243 episodes) were amoxicillin, azithromycin, cefdinir, cefprozil and levofloxacin, moxifloxacin. The mean length of an AOM episode was 8.1 to 13.0 days. Mean total expenditures among the episodes was \$196, with a range of \$165 to \$244. Multivariate ECM models were fitted and showed significant incremental cost reductions per episode associated with telithromycin relative to: cefdinir (–\$64, p < 0.001), cefprozil (–\$65, p < 0.001) and clarithromycin (–\$47, p < 0.001). **CONCLUSION:** The results of this study show that the costs differed among episodes of AOM by the initiating antibiotic. Use of propensity score matching and ECM regression controlled for intra-episode differences, so the incremental costs differences may be attributed to other factors such as disease severity. Although different antibiotics may be in the same drug class, the choice of the initiating antibiotic for an AOM episode in this adult population clearly had financial implications.

PEY5

A COST-BENEFIT ANALYSIS OF THE SN60WF ASPHERIC INTRAOCULAR LENS

Waycaster C

Alcon Laboratories Inc, Fort Worth, TX, USA

OBJECTIVES: The objective of this analysis was to determine the net economic benefit to society from a SN60WF new technology intraocular lens (NTIOL) with an aspheric surface used for the treatment of cataracts. **METHODS:** The incremental costs of the aspheric SN60WF NTIOL were derived from the additional \$50 reimbursement paid by the U.S. Centers for Medicare and Medicaid Services (CMS) for implantation of NTIOLs in Medicare beneficiaries with cataracts. The economic benefits of the SN60WF were based on projected cost savings from averted rear-end passenger vehicle collisions in the recipient population due to improved functional vision. Improved functional vision was established using driving simulation results comparing SN60WF recipients to patients implanted with a conventional monofocal intraocular lens. A societal perspective and a ten year time frame were used in the analysis. All costs and benefits were discounted at 3%. **RESULTS:** The incremental costs to CMS for SN60WF implantation over the next decade were estimated at \$60 million U.S. dollars (USD). Driving simulation results indicated that SN60WF recipients performed better than the control group in 34 of 36 driving tests. Furthermore SN60WF recipients were able to detect and identify potential road hazards from 0.5 to 1 second before the control patients in 12 of the 36 tests. The economic benefits from averted rear-end passenger vehicle collisions were estimated in the range of \$105 to \$158 million USD for the same 10 year period. Consequently, the net economic benefit to society was estimated between \$45 and \$98 million USD over the next decade. A threshold analysis revealed that a reduction in rear-end collisions of 31% within the SA60WF recipient population was enough to offset the incremental NTIOL costs associated with the new lens. **CONCLUSION:** Implantation of the NTIOL SN60WF in cataract patients provides a net economic benefit to society far in excess of its incremental costs.

PEY6

THE RELATIVE COST-EFFECTIVENESS OF MULTIFOCAL INTRAOCULAR LENSES

Waycaster C

Alcon Laboratories Inc, Fort Worth, TX, USA

OBJECTIVES: The objective of this study was to determine the relative cost-effectiveness of three multifocal intraocular lenses (IOLs) commonly implanted in cataract patients. **METHODS:** A cost-effectiveness analysis was performed to determine the cost-effectiveness ratios for the following three multifocal intraocular lenses available in the U.S. health care market: an apodized diffractive multifocal (ADM) IOL, a zonal refractive multifocal (ZRM) IOL and an accommodating posterior chamber (APC) IOL. The measure of effectiveness used was vision adjusted life years (VALYs). VALYs are the product of the uncorrected near visual acuity (UCNVA) provided by the IOLs and the average life expectancy of the cataract patients. UCNVA, expressed in decimal notation, and cost estimates were taken from the medical literature. UCNVA was chosen as the measure of effect because it is generally accepted that uncorrected distance visual acuity outcomes are similar between the 3 alternative IOLs. The economic perspective was that cataract patients enrolled in the United States Medicare program. Only the direct incremental costs of the multifocal IOLs were considered in the analysis. The time span of the analysis was 14.2 years based on cataract patients' average life expectancy (ALE). No cost discounting was performed because all incremental costs considered accrue in year one. **RESULTS:** The average cost to patients for bilateral multifocal IOL implantation was estimated at \$4000. The average UCNVAs, expressed in Snellen decimal notation, for the ADM, ZRM and APC IOLs were 0.80, 0.57 and 0.7, respec-

tively. The VALY products of UCNVA and ALE for the ADM, ZRM and APC IOLs were 11.36, 9.94 and 8.09 respectively. The resultant VALY cost-effectiveness ratios for the ADM, ZRM and APC IOLs were \$352.11, \$494.19 and \$402.41, respectively. **CONCLUSION:** Given the incremental cost associated with multifocal IOLs the ADM IOL provides cataract patients with the best value for their money.

PEY7

EFFECTIVENESS AND COSTS OF PROSTAGLANDINS, WITH CAI OR AN ALPHA-2 AGONIST, IN THE TREATMENT OF GLAUCOMA: ANALYSIS CONDUCTED ON THE UK GENERAL PRACTITIONER RESEARCH DATABASE

Berdeaux G¹, Lafuma A², Guelfucci F², Barnes R³

¹Alcon France, Rueil-Malmaison, Hauts de Seine, France, ²Cemka-Eval, Bourg-la-Reine, France, ³Alcon Laboratories Inc, Fort Worth, TX, USA

OBJECTIVES: To compare the effectiveness and related costs of prostaglandins (PG) associated with either alpha-2 agonists or carbonic anhydrase inhibitors (CAI), in the treatment of glaucoma, according to the UK General Practitioner Research Database (UK-GPRD). **METHODS:** Data were extracted on patients diagnosed with ocular hypertension or glaucoma who had undergone topical treatment, surgery or laser therapy. A subsequent selection identified patients receiving prostaglandins associated with an alpha-2 agonist (PG + alpha-2) or CA inhibitor (PG + CAI). Treatment failure was defined as a prescription change (addition or removal of a topical treatment). Times to treatment failure were compared using an adjusted Cox model. Drugs, clinic visits and glaucoma procedures were collected over a fixed period for a cost minimization analysis, performed from the NHS perspective. **RESULTS:** Data on 56,612 patients were extracted and 39,808 had received at least one topical prescription for glaucoma. The treatment for 1384 patients was PG + alpha-2 and for 4792 patients PG + CAI. Patient characteristics did not differ significantly between the two populations. The average age at diagnosis was 69.0 years and 47.6% were male. Treatment failure within one year occurred for 70.0% of patients receiving PG + alpha-2 and for 59.5% receiving PG + CAI ($p < 0.001$). The hazard ratio 0.822 for failure, after adjusting on age, gender, and comorbidities, was less with PG + CAI ($p < 0.001$) than PG + alpha-2. The adjusted cost of PG + alpha-2 treatment (£441 p.a.) did not differ significantly ($p = 0.23$) from PG + CAI (£413). **CONCLUSION:** According to UK GPRD information, PG + CAI is more efficient than PG + alpha-2 for treating glaucoma patients. Patients remained under treatment longer with PG + CAI, than with PG + alpha 2, at a similar cost.

PEY8

EFFECTIVENESS AND COSTS OF BETA-BLOCKERS WITH CAI OR ALPHA-2 FOLLOWING GLAUCOMA TREATMENT FAILURE: AN ANALYSIS CONDUCTED ON THE UK GENERAL PRACTITIONER RESEARCH DATABASE

Berdeaux G¹, Lafuma A², Guelfucci F², Barnes R³

¹Alcon France, Rueil-Malmaison, Hauts de Seine, France, ²Cemka-Eval, Bourg-la-Reine, France, ³Alcon Laboratories Inc, Fort Worth, TX, USA

OBJECTIVES: To compare the effectiveness and costs of beta-blockers, combined with alpha-2 agonists or carbonic anhydrase inhibitors (CAI), as replacements for failed first-line treatments in glaucoma, according to the UK General Practitioner Research Database (UK-GPRD). **METHODS:** Data on treated ocular hypertension or glaucoma patients (topical, surgical or laser treatments) were extracted. Target patients were prescribed beta-blockers with alpha-2 agonists or CA inhibitors as replacements for failed treatment regimens. A subsequent change of prescription (addition or removal of a topical treatment) constituted a